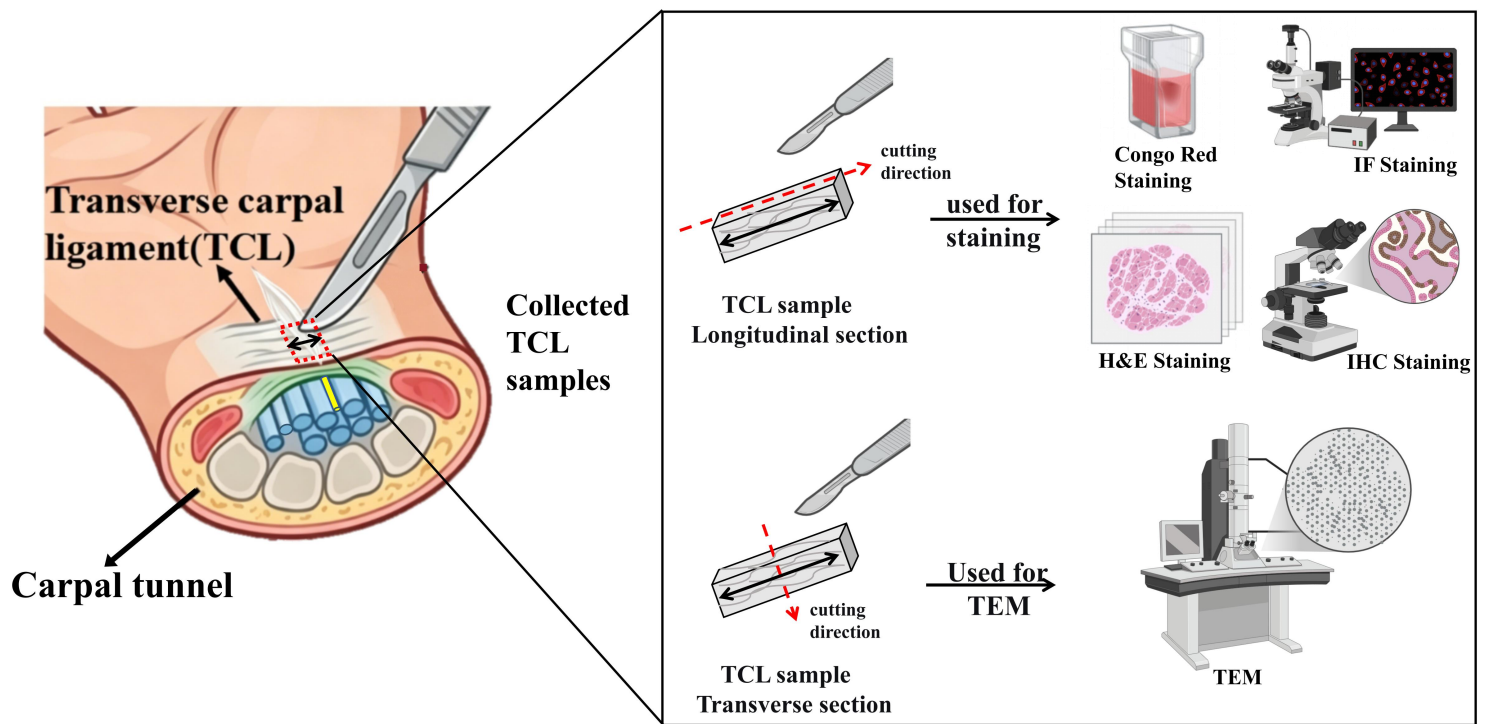
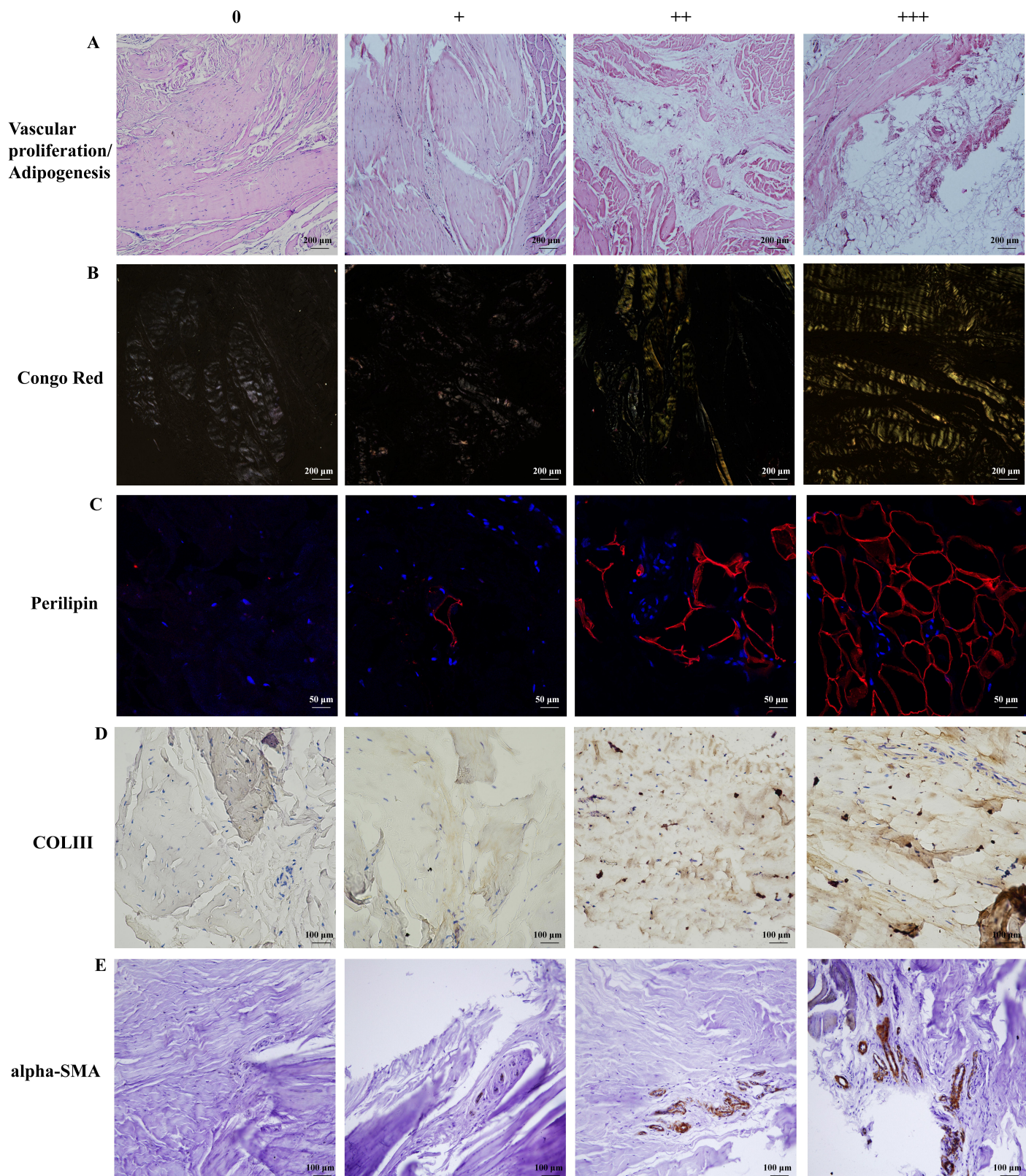
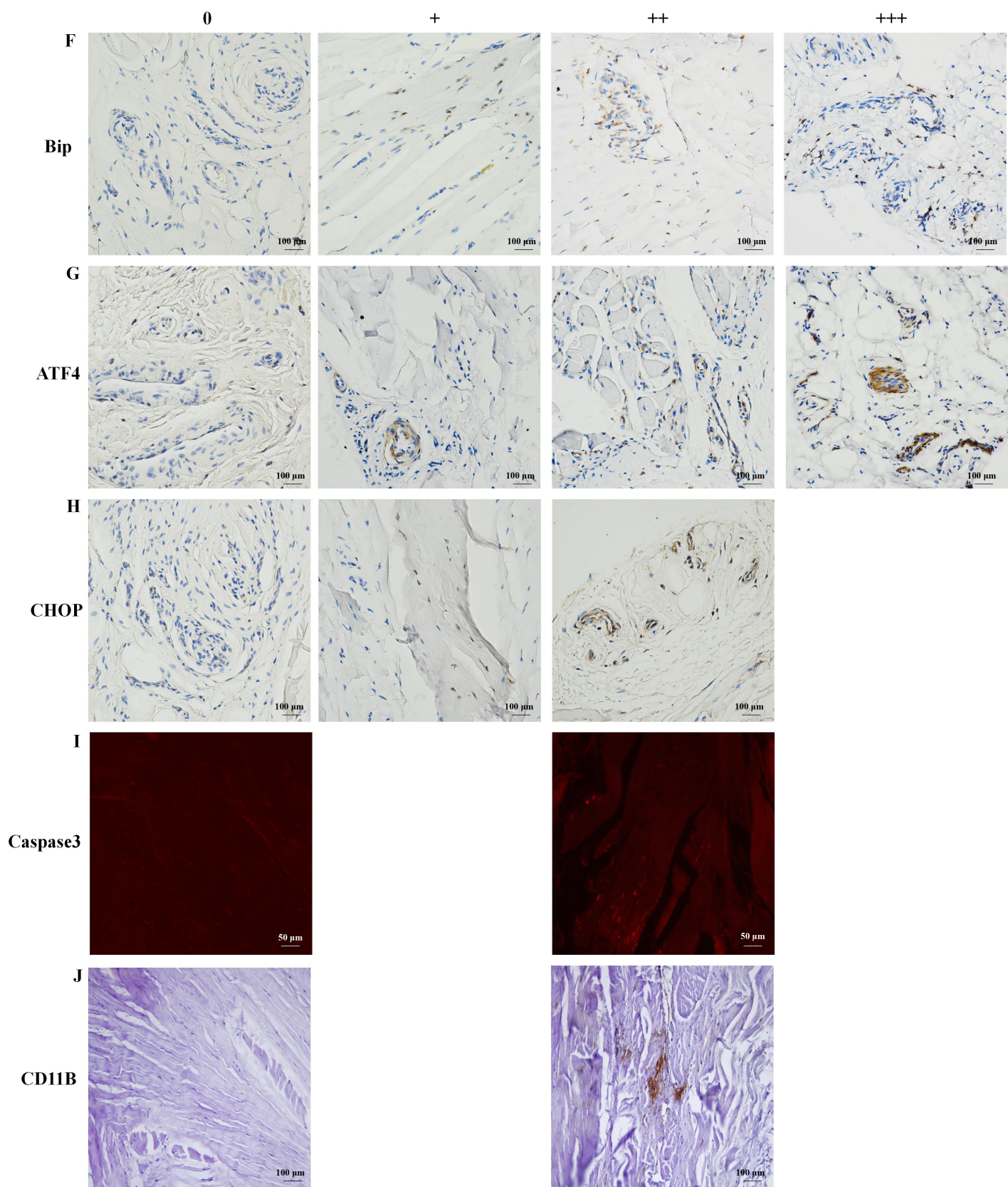




Supplementary Fig. 1 Schematic diagram of TCL biopsy and sectioning orientation.

The biopsy site (dashed box) is located in the central region of the TCL. Longitudinal section along the ligament axis was used for histological and immunohistochemical staining, whereas transverse section perpendicular to the ligament axis was used for TEM analysis.





Supplementary Fig. 2 Representative images for the grading system (0, +, ++, +++). Staining includes H&E (A), Congo red (B), Perilipin (C), COLIII (D), alpha-SMA (E), BiP (F), ATF4 (G), CHOP (H), Caspase3 (I), and CD11B (J). Scale bars are 50, 100, or 200 μm as indicated.

Supplementary Table 1. Demographic characteristics of the study cohort

Characteristic	Idiopathic CTS (n = 44)	Control (n = 5)
Age (years)		
Mean $\pm$ SD	55.17 $\pm$ 12.44	40.20 $\pm$ 7.63
Range	32-87	32-48
Gender, n (%)		
Female	31 (70.5%)	0 (0%)
Male	13 (29.5%)	5 (100%)
Female: Male ratio	2.38: 1	0: 1

SD: Standard Deviation; CTS: Carpal Tunnel Syndrome; N/A: Not applicable.

Supplementary Table 2. Positive rates of histopathological markers stratified by sex and age

Marker	Total (n=44)	Male (n=13)	Female (n=31)	P value (sex)	≤55 yr (n=27)	>55 yr (n=17)	P value (age)
Congo Red	14/44 (31.8%)	5 (38.5%)	9 (29.0%)	0.724	7 (25.9%)	7 (41.2%)	0.334
Perilipin	20/44 (45.5%)	5 (38.5%)	15 (48.4%)	0.742	11 (40.7%)	9 (52.9%)	0.539
COLIII	28/44 (63.6%)	6 (46.2%)	22 (71.0%)	0.172	14 (51.9%)	14 (82.4%)	0.057
α-SMA	19/44 (43.2%)	3 (23.1%)	16 (51.6%)	0.105	9 (33.3%)	10 (58.8%)	0.125
BiP	19/44 (43.2%)	4 (30.8%)	15 (48.4%)	0.335	11 (40.7%)	8 (47.1%)	0.760
ATF4	16/44 (36.4%)	3 (23.1%)	13 (41.9%)	0.314	9 (33.3%)	7 (41.2%)	0.750
CHOP	5/44 (11.4%)	1 (7.7%)	4 (12.9%)	1.000	2 (7.4%)	3 (17.6%)	0.359
Caspase3	6/44 (13.6%)	2 (15.4%)	4 (12.9%)	1.000	2 (7.4%)	4 (23.5%)	0.186
CD11B	1/44 (2.3%)	0 (0%)	1 (3.2%)	1.000	1 (3.7%)	0 (0%)	1.000
Vascular proliferation	15/44 (34.1%)	2 (15.4%)	13 (41.9%)	0.162	8 (29.6%)	7 (41.2%)	0.521

P values are calculated using two-sided Fisher's exact tests